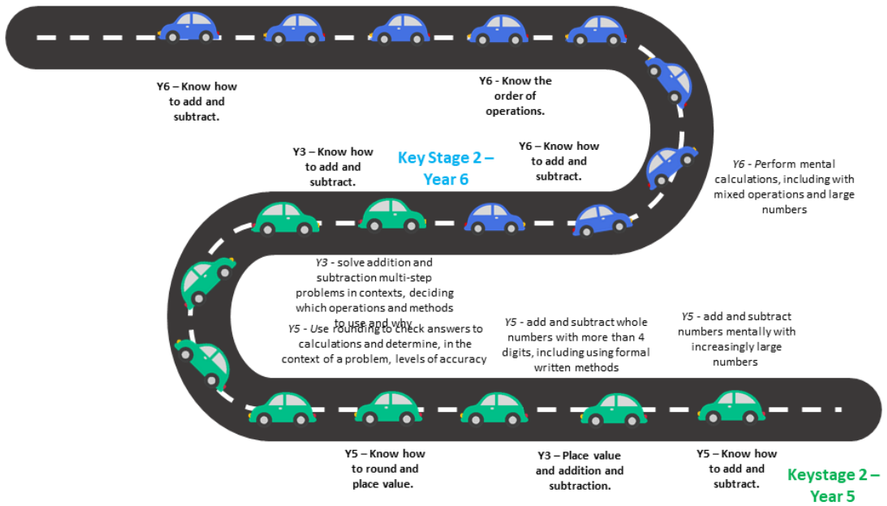
Hailsham Community College - Secondary

Maths Curriculum

Addition and Subtraction Curriculum Roadmap



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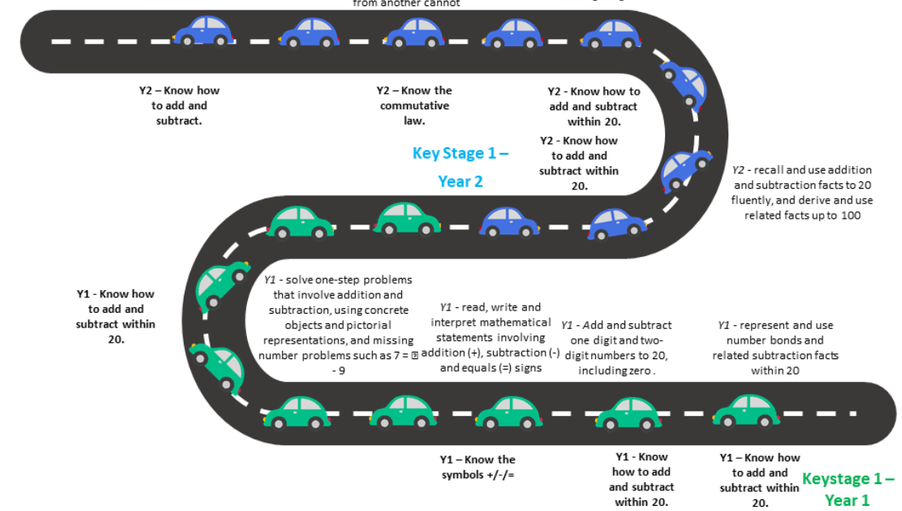

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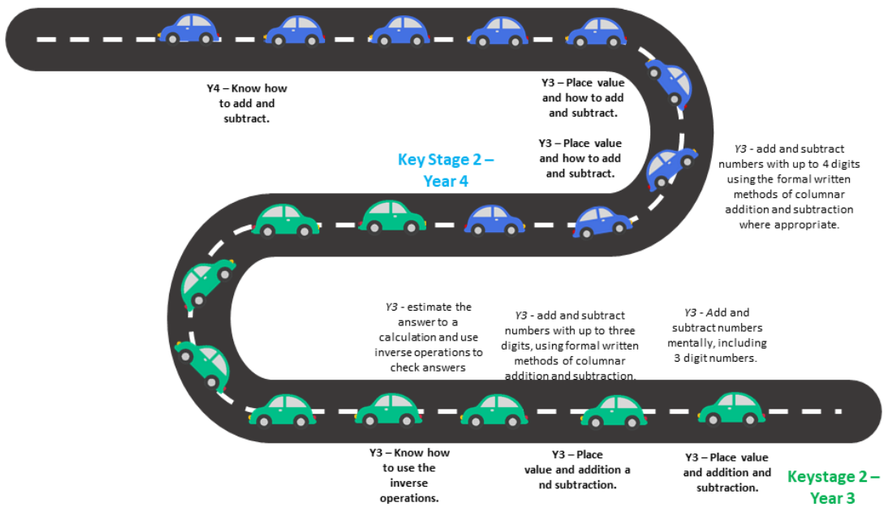

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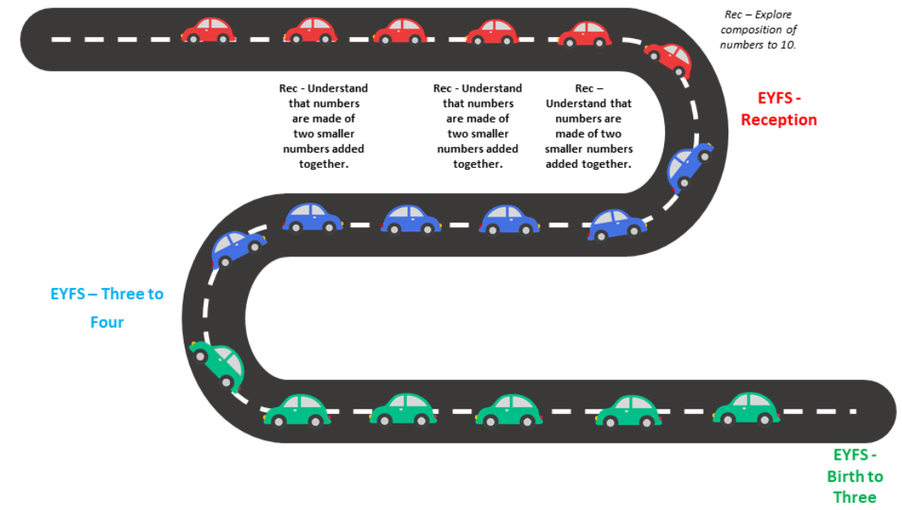
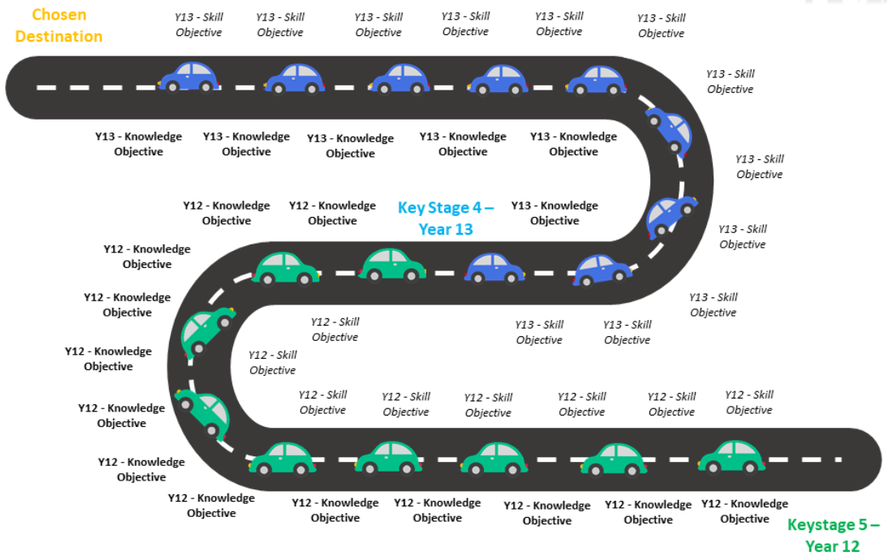


Algebra Curriculum Roadmap



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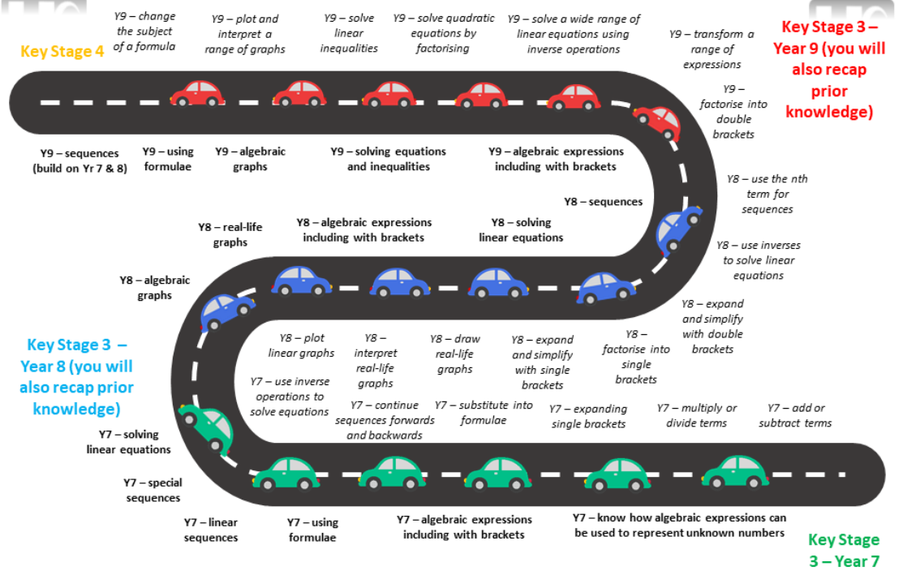

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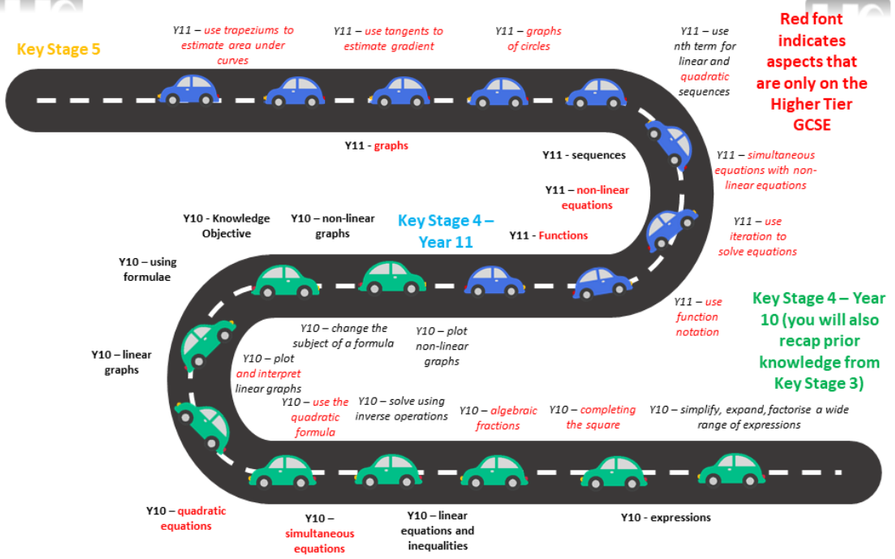

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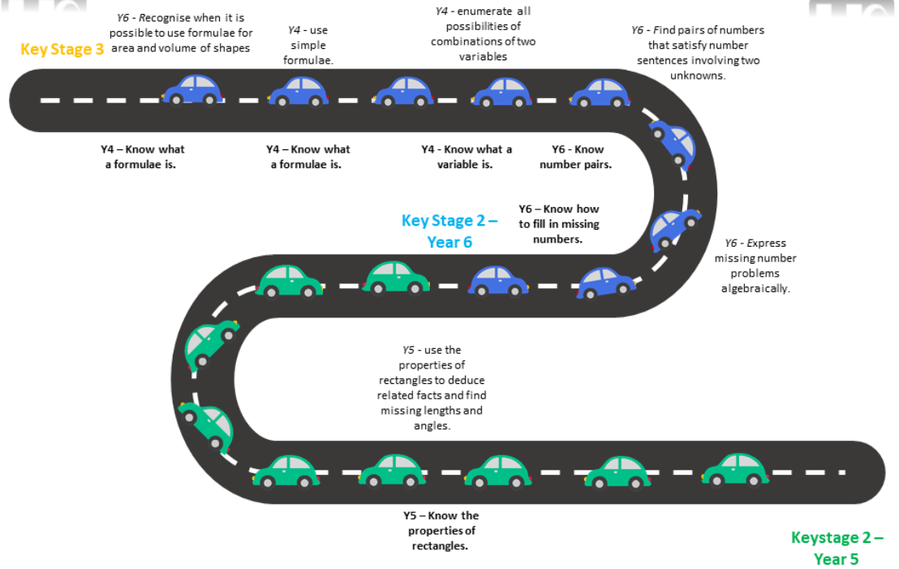

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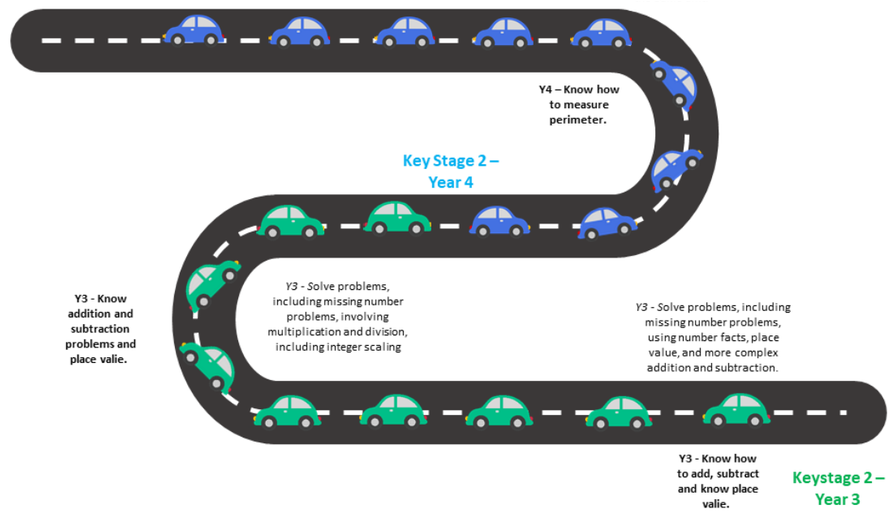

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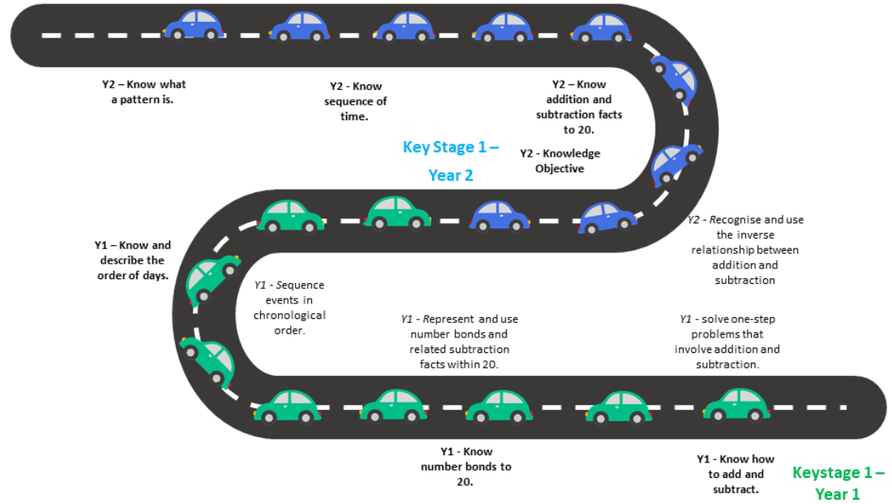
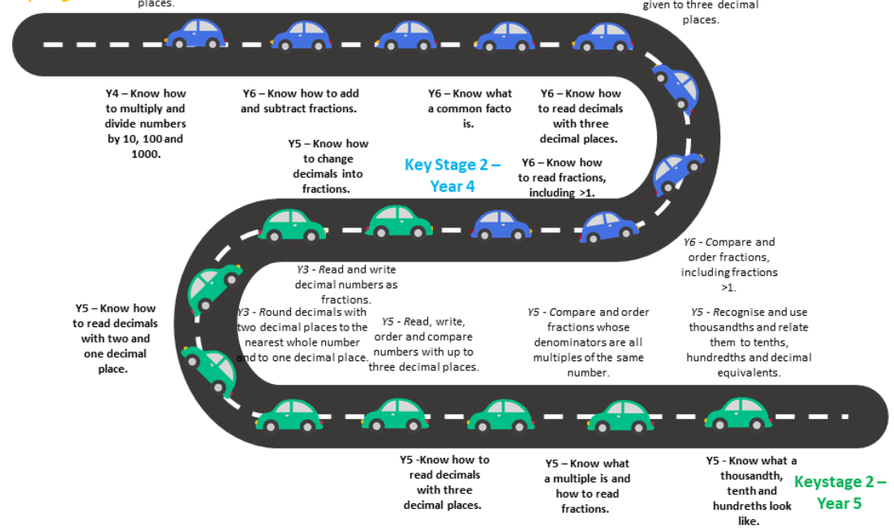


Fractions Curriculum Roadmap



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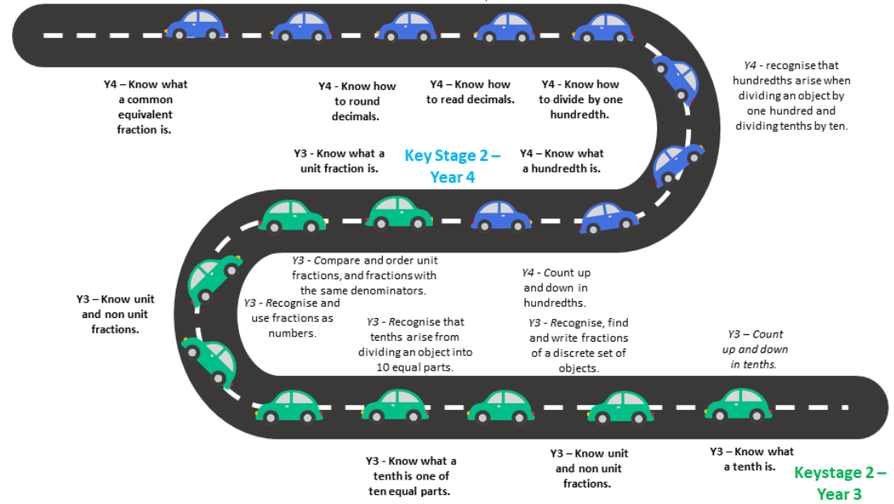

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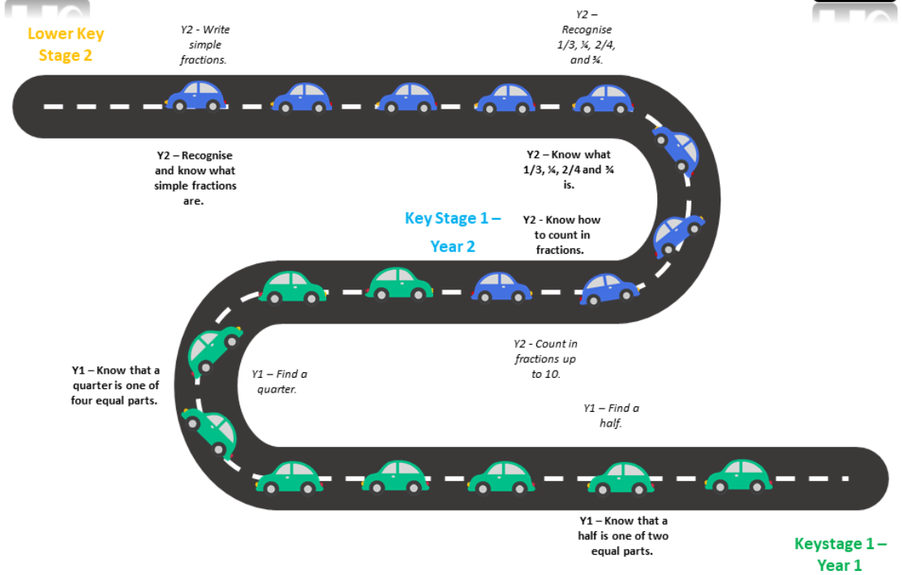

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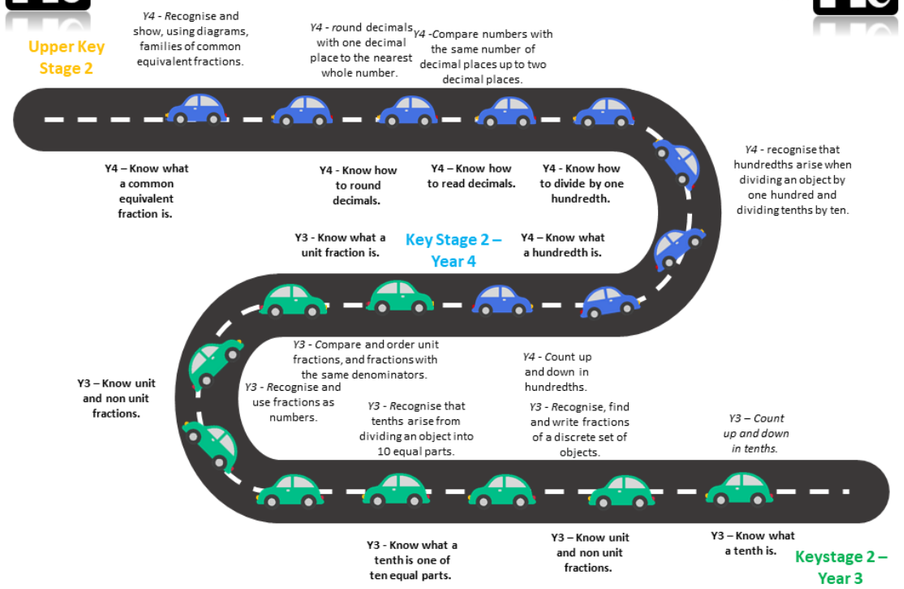

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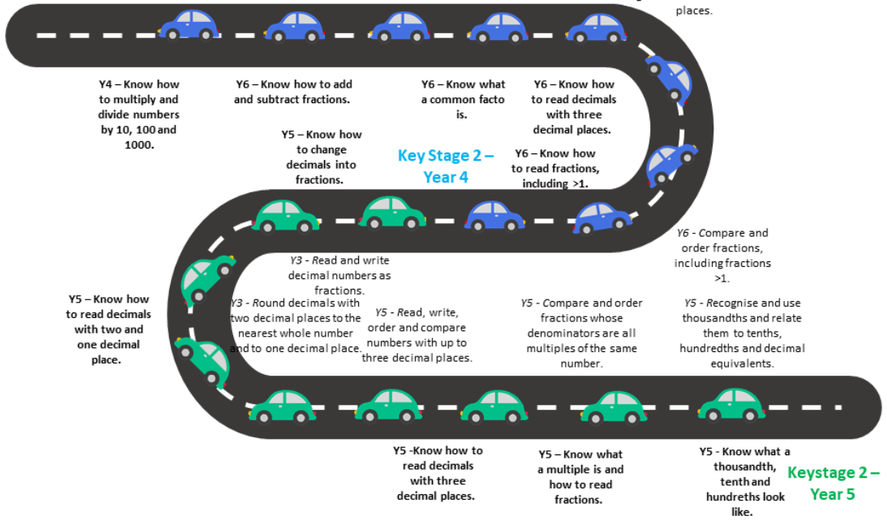

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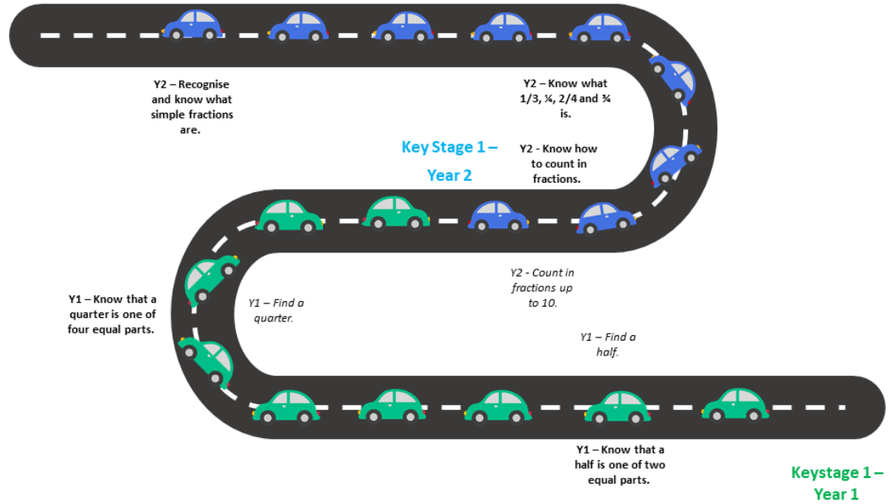
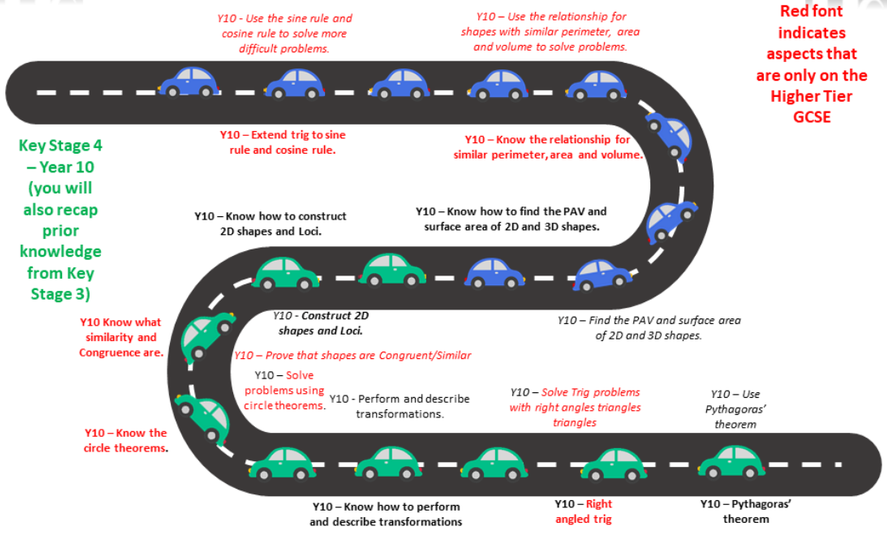
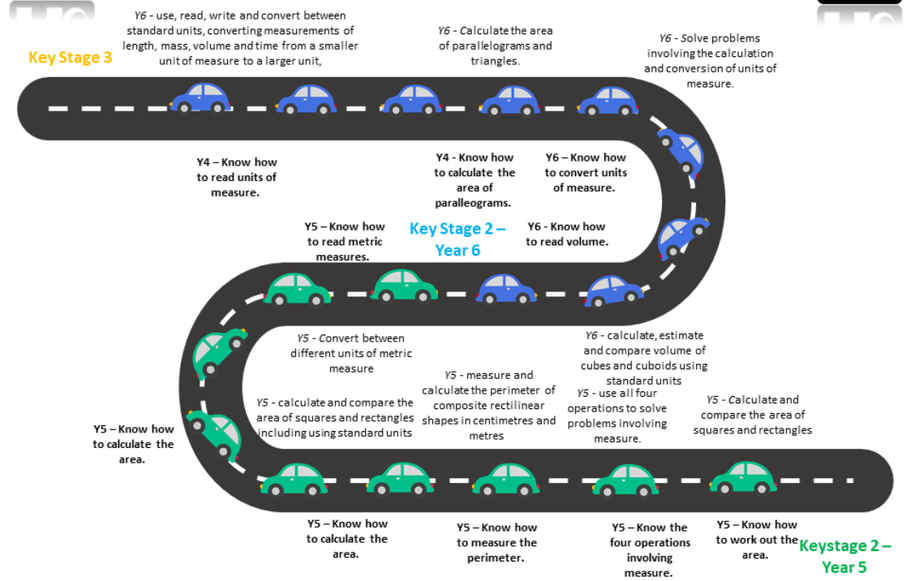


Geometry Curriculum Roadmap



Measurement Curriculum Roadmap



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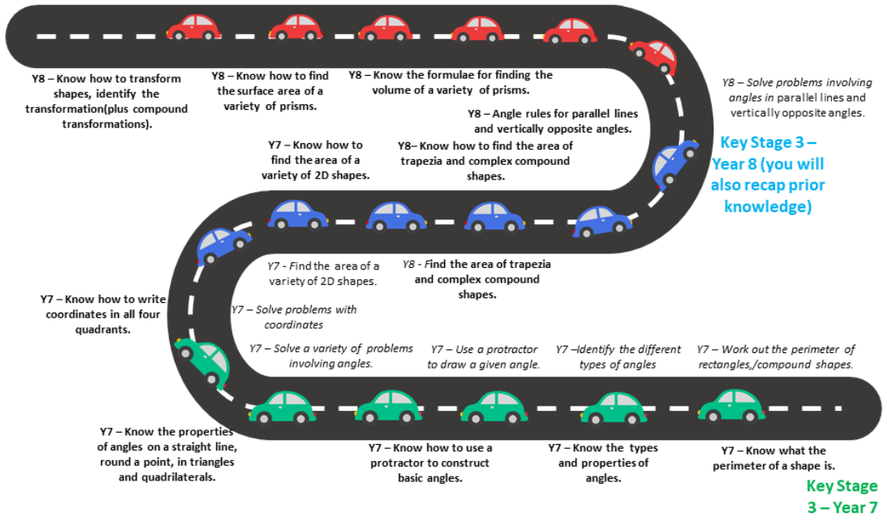

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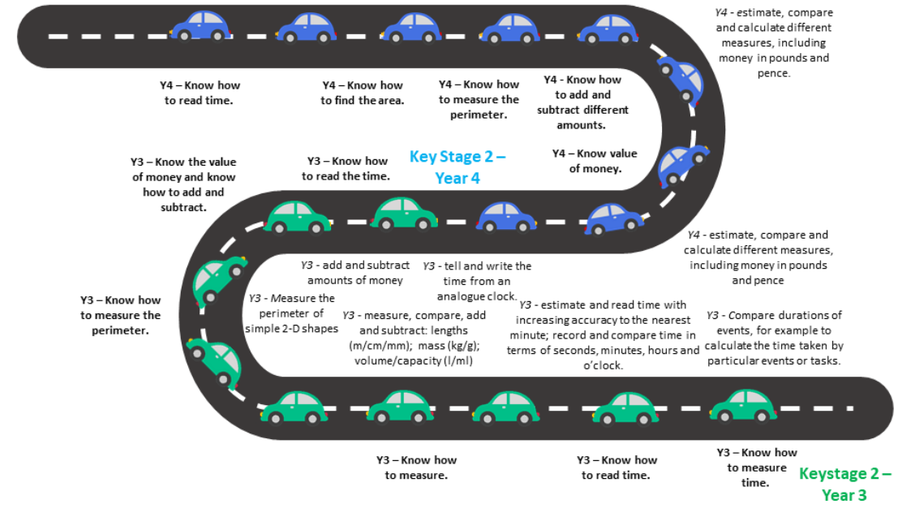

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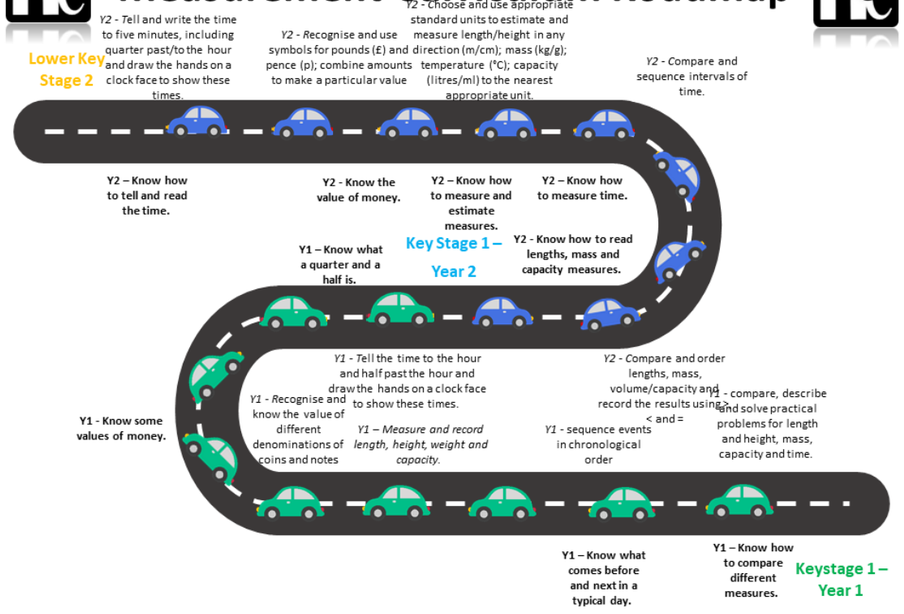
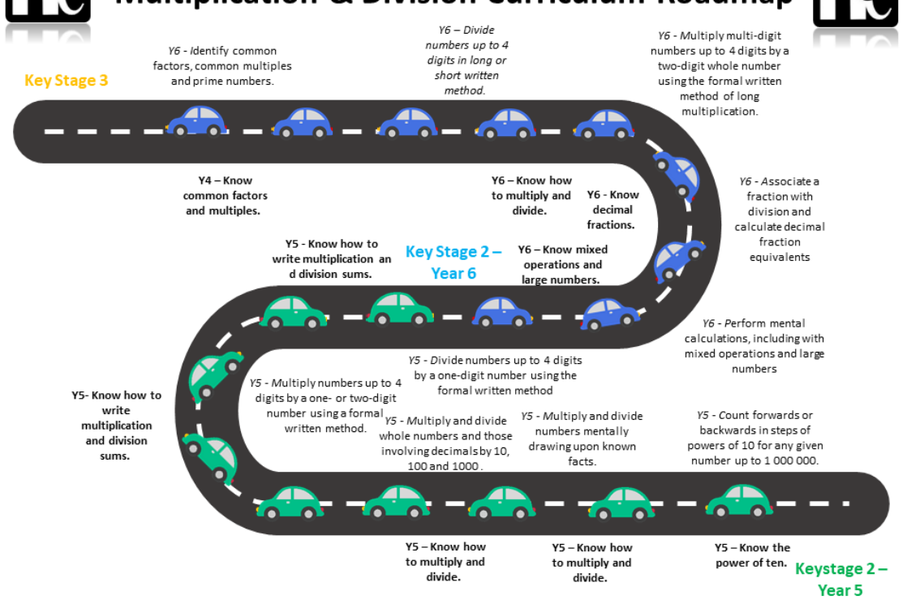


Multiplication & Division Curriculum Roadmap



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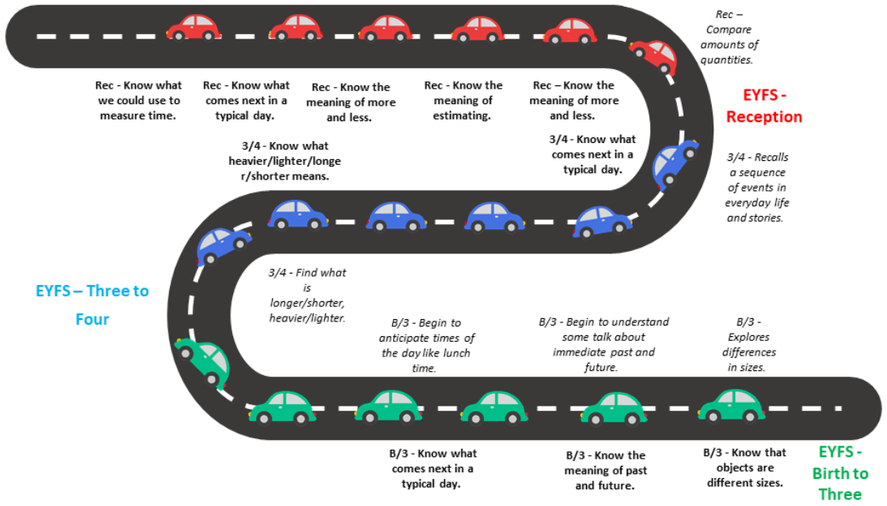

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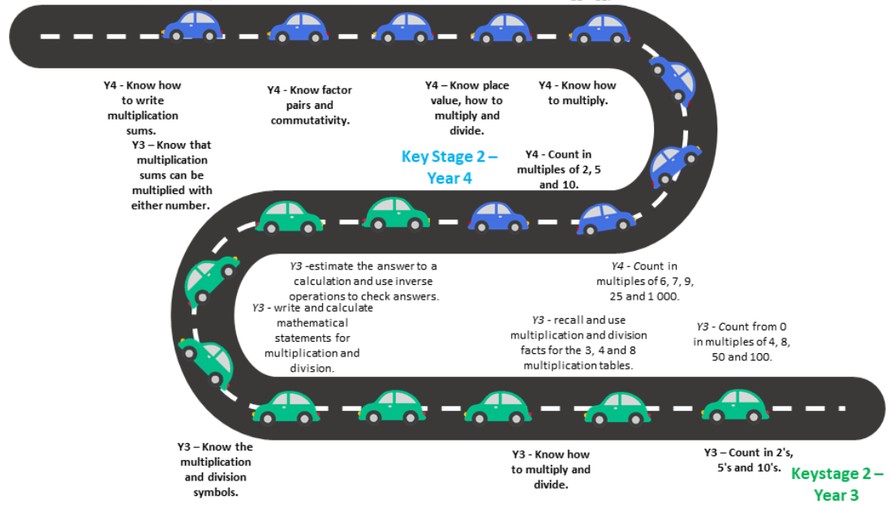

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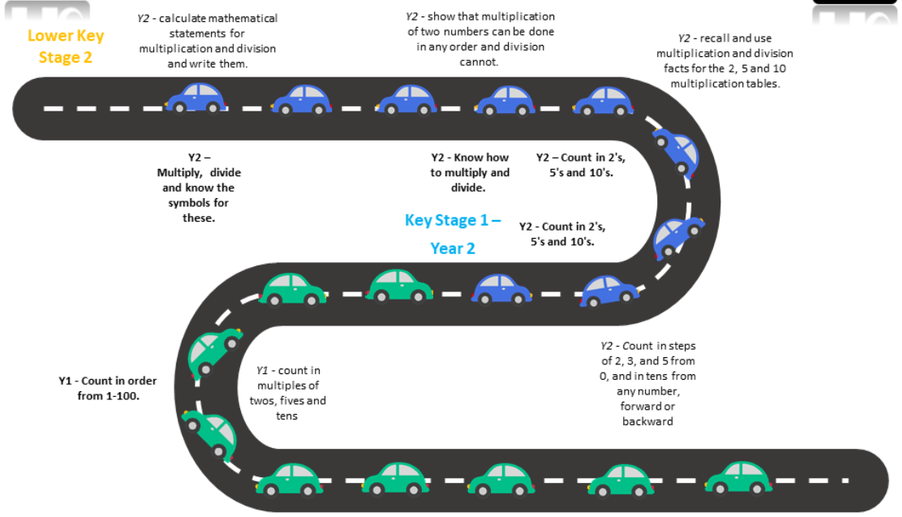
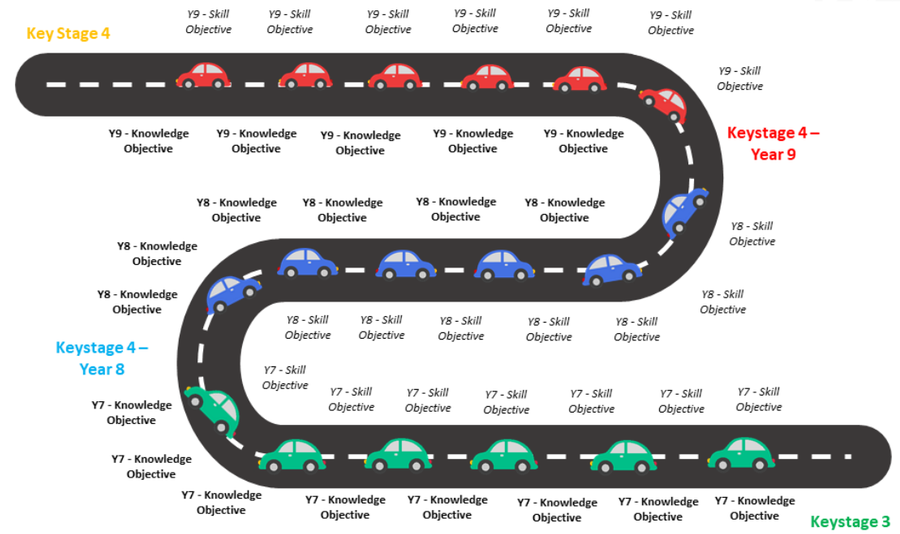


Ratio and Proportion Curriculum Roadmap



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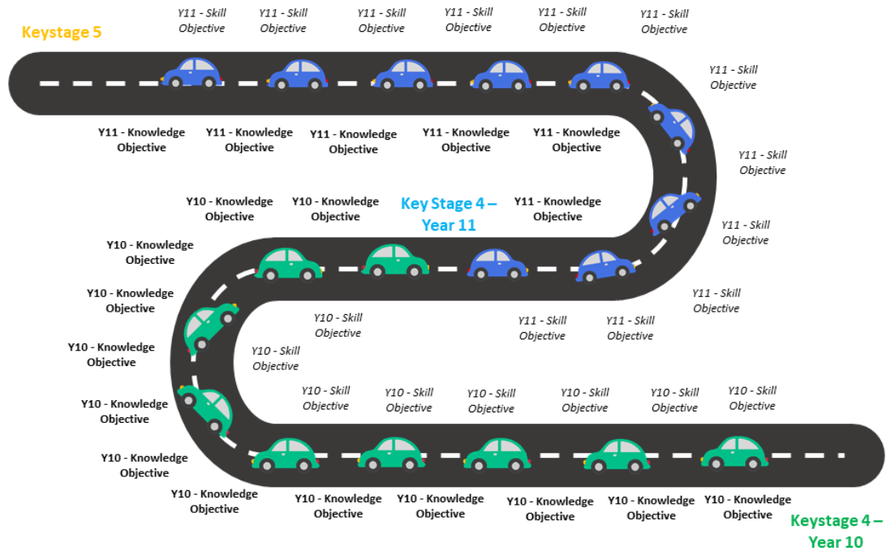

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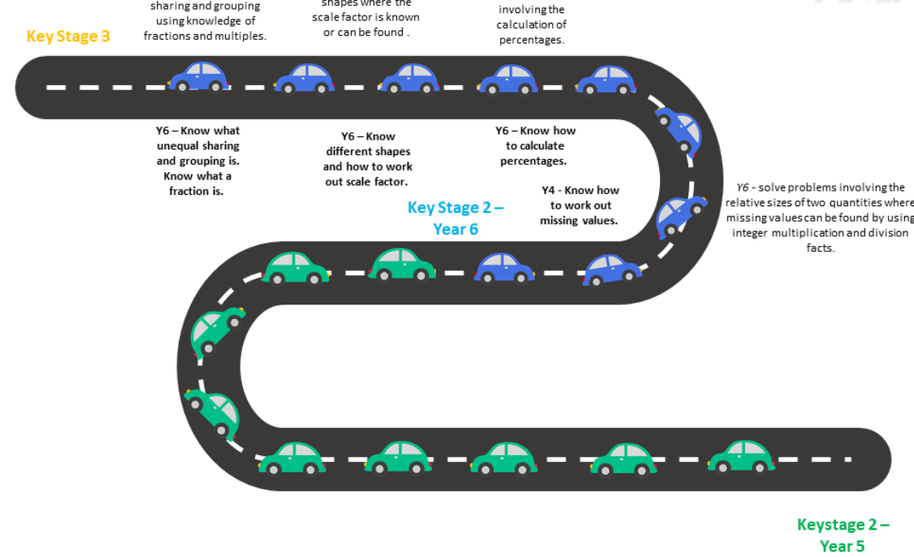
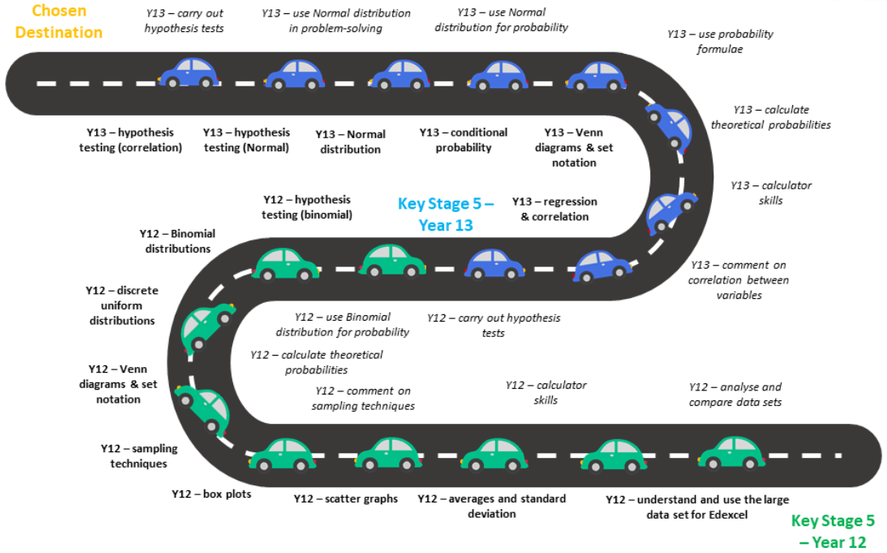


Statistics & Probability Curriculum Roadmap



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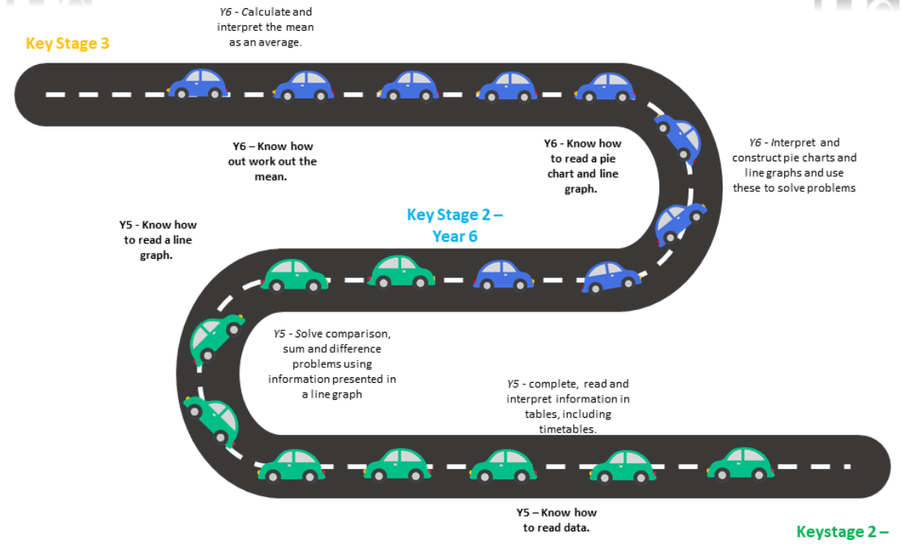

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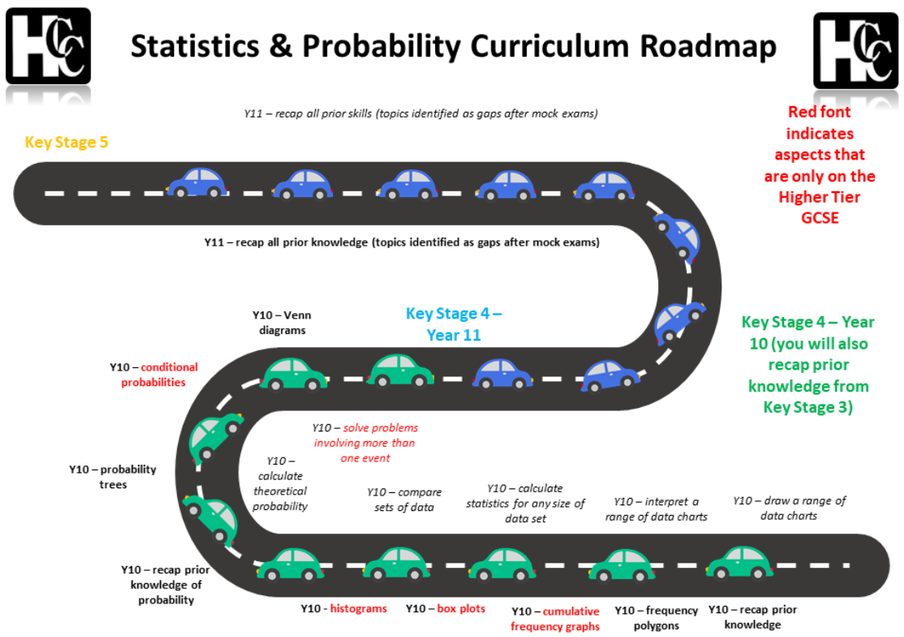

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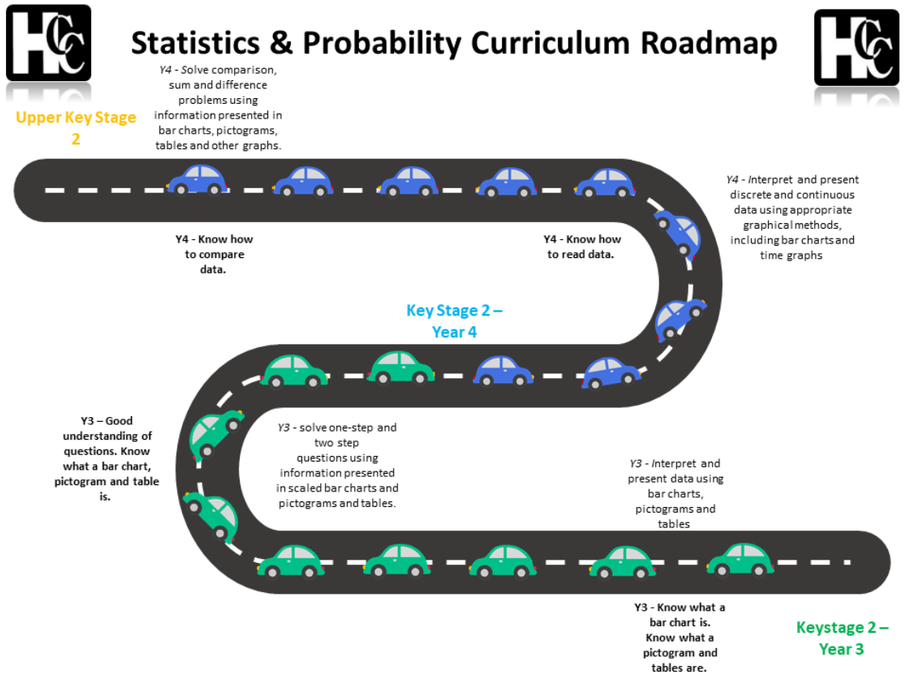

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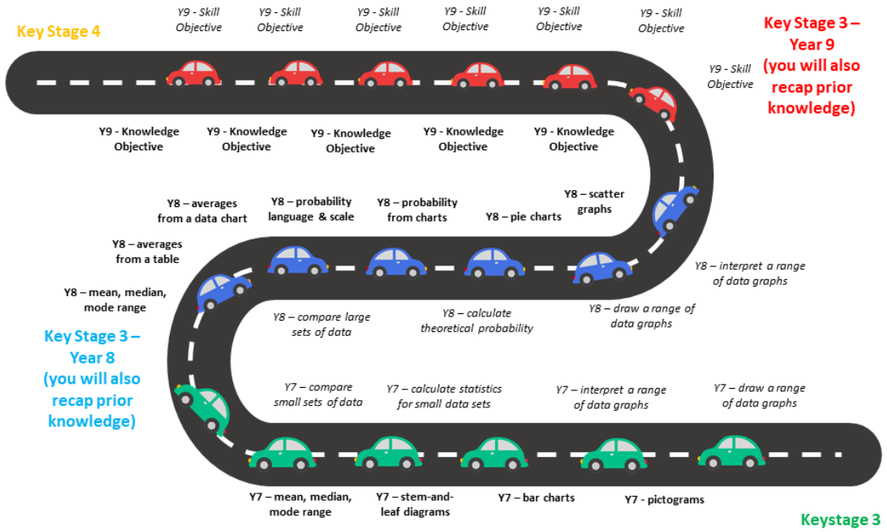

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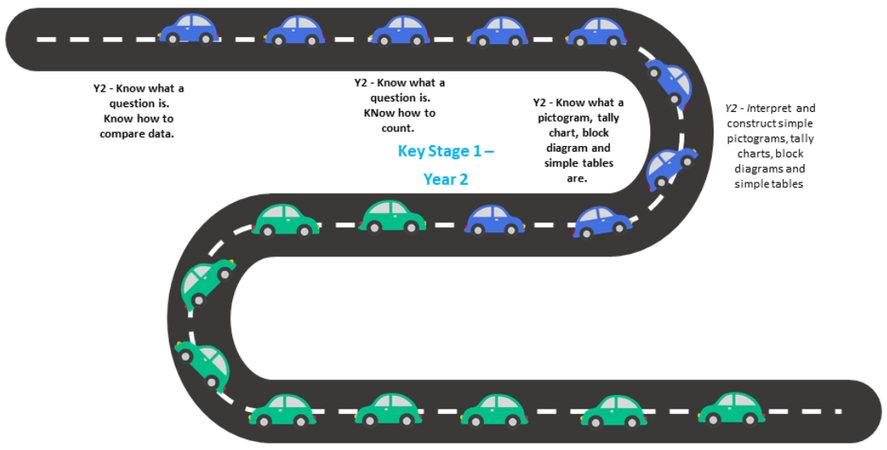

Mathematics Curriculum Intent:

To enable learners to master key skills and knowledge in order to confidently think and reason mathematically so that they can solve a wide range of problems; to successfully apply their knowledge in their personal and professional lives.

HAILSHAM COMMUNITY COLLEGE
ACADEMY TRUST

'Be the very best you can be'

Assessment and feedback policy Hailsham Community College MATHS

SLT responsible:	ML
Proposed	
Ratified by Governors:	n/a

The key principles of assessment and feedback at HCC

- Assessment will happen when determined by the **curriculum.**
- **Formative** assessment should take place **frequently**.
- Assessment will inform teachers and students of **gaps in knowledge** and/or **skills**.
- Assessment will inform **actions** that take place to close gaps in student's knowledge and/or skills.
- All feedback will be **timely and informative**
- **Summative assessment** will provide a benchmark against which progress and achievement can be measured. At KS4 and 5 this will be against nationally recognised benchmarks eg GCSE or A-level grades. At KS3, in the absence of external benchmarks this will be against start points and internal data.
- **Summative assessment** will be reported 3 times per year.
- **College reports** should enable parents and carers to understand their son/daughter's progress over time.
- Full details of the assessment and feedback process will be mapped in each department
  - **What** powerful knowledge/ key skills is/are being assessed
  - **How** assessment takes place
  - **When** assessment takes place
  - **Feedback** given
  - **Actions resulting** for teachers
  - **Actions resulting** for students

Directors of Learning will:

- Ensure that departmental assessment and feedback maps follow the **key principles of assessment at HCC** detailed above and provide clear guidelines for teachers within the team;
- Ensure that teachers assess learners work and learning in accordance with the department assessment map
- Ensure that teachers keep accurate records of assessments to ensure that all learners make progress.
- Ensure that teachers give feedback in line with the key principles of assessment at HCC above.

Teachers will :

- Assess learners work and learning in accordance with the department assessment map
- Keep accurate records of assessments to ensure that all learners make progress.
- Give feedback in line with the key principles of assessment at HCC above.

Monitoring of the assessment cycle

Monitoring and sampling of the assessment cycle is in place to quality assure the process at all levels. Most importantly this will support a continual process of reflection and self-improvement in all colleagues professional practice

Sampling of summative assessments and evidence of feedback? When? By who?

Learning walks to evidence and improve feedback from summative assessments and actions resulting. When and by who?

Learning walks to evidence and improve ongoing formative assessment. When and by who

Overview of assessment and reporting cycle:

The time of assessment will be guided by the curriculum. The following is a guide to when such assessment is reported. There may be some departmental variation in the 'informed by' column, full details are in all department assessment maps.

Date	Assessment point	Informed by
Friday 22nd October	Year 7 APA	Summative assessment of curriculum knowledge/skills term 1 End of Term 1 Review Test
Friday 12th November	Year 11 and 13 APA	Year 11 Mock 1 (plus classroom based assessment) Year 13 Summative and classroom based assessment of curriculum knowledge skills term 1.
Friday 19th November	Year 9 APA	Summative assessment of curriculum knowledge/skills term 1 TA1 percentage score
Friday 3rd December	Year 8 APA	Summative assessment of curriculum knowledge and skills term ½ End of Term 1 Review Test
Friday 14th Jan	Year 10 and 12 APA	Year 10 mock 1 (class based) and classroom based assessment TA1 Grade Year 12 mock 1 (class based) and classroom based assessment
Friday 11th Feb	Year 7 APB	Summative assessment of content terms 1+2/3 TA1 percentage score
Friday 4th March	Year 11 and 13 APB	Year 11 Mock 2 (plus classroom based assessment) Year 13 Mock series 1 (plus classroom based assessment)
Friday 11th March	Year 8 APB	Summative assessment of curriculum knowledge and skills term 1+2+3 TA1 percentage score
Friday 1 April	Year 9 APB	Summative assessment of curriculum knowledge and skills term 1+2+3/4 TA2 percentage score
Friday 29 April	Year 10 and 12 APB	Year 10 mock 2 (class based) plus classroom based assessment TA2 Grade Year 12 mock 2 (class based) plus classroom based assessment
Friday 13th May	Year 11 and 13 final predictions	Final predicted grade based on cumulative knowledge of classroom based assessment over 10 and 11
Friday 27th May	Year 7 APC	Summative assessment of curriculum knowledge and skills term 1+2+3+4/5 End of Term 4 percentage score
Friday 17th June	Year 8 APC	Summative assessment of curriculum knowledge and skills term 1+2+3+4+5 End of Term 4 percentage score
Friday 24th June	Year 9 APC	Summative assessment of curriculum knowledge and skills term 1+2+3+4+5 TA3 percentage score
Friday 1st July	Year 10 and 12 APC	Year 10 coaching mocks plus classroom based assessment TA3 Grade Year 12 coaching mocks and classroom based assessment

Year 7	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
What powerful knowledge is being assessed?	Place Value Units of Measure Time Operations: add and subtract	Angle Facts Operations: multiply and divide Types of Number	Coordinates Data Graphs	Equivalence Fractions Expressions	Percentages (finish) Substitution Averages	Sequences Equations
How (type of assessment)?	For every term: Preview test – benchmark assessment to identify gaps. Review test – assesses if gaps have been filled. Each is approximately 20 questions of key skills. Each lesson starts with a retrieval task appropriate to the group's needs. The teacher also assesses the class by monitoring students' work in lessons.					
When? (Weeks are the Scheme of Work weeks as per OneNote)	Preview – week 1 Review – week 7/8 Cumulative assessment is the Review	Preview – week 9 Review – week 15	Preview – week 16 Review – week 20 Cumulative assessment Week 18	Preview – week 21 Review – week 28	Preview – week 29 Review – week 36 Cumulative assessment Week 31	Preview – week 37 Review – week 40
What feedback is given?	Preview test is self-marked. Review test marked by teacher and score provided to the students. Further discussion of correct methods may be included as appropriate. Cumulative assessments are marked by teacher and returned to student. As appropriate to the group's needs, the teacher may spend time looking at correcting questions with the whole class or with small groups. In lessons, teachers may use live whole-class and individual feedback. This may be verbal or written as appropriate.					
What actions must take place for teachers?	Preview test informs teacher planning for the term's units – what existing knowledge do the students have? What gaps need to be filled by the teaching of each unit of work? Review test informs Do Now and home learning for the following term to fill gaps and reinforce topics through retrieval practice. Where a gap exists for a topic which feeds into a new unit of work, the teacher needs to be aware and fill that gap before the next topic which needs it. Cumulative assessments inform retrieval tasks and home learning for the next term. The final cumulative assessment, combined with teacher knowledge of the students, informs the allocation of student groups for the following academic year.					

	A QLA of the final assessment is stored centrally to inform the following year's teacher of weaker areas in the group's collective knowledge.					
What actions must take place for students ?	Students engage with the learning in the lesson. They must complete home learning tasks to support gap filling. Where directed, students must engage in correcting their cumulative assessments.					
When is this revisited?	Perimeter (part of add and subtract) is revisited in Fractions and Expressions	Area (part of multiply and divide) is revisited in Fractions and Expressions		Fractions may be revisited in Substitution as appropriate to the group.		
	All topics are revisited and built-on during Year 8 units of work.					

Year 8	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
What powerful knowledge is being assessed?	Fractions Area and Perimeter Angle reasoning	Types of number. Averages Percentages Probability	Probability. Algebraic graphs. Indices. 3D Shapes part 1.	Ratio Expressions. Data Graphs.	Solving equations Sequences 3D shapes part 2	Scale Drawing. Proportion. Transformations.
How (type of assessment)?	For every term: Preview test – benchmark assessment to identify gaps. Review test – assesses if gaps have been filled. Each is approximately 20 questions of key skills. Each lesson starts with a retrieval task appropriate to the group's needs. The teacher also assesses the class by monitoring students' work in lessons.					
When?	Preview – week 1 Review – week 7/8 Cumulative assessment is the Review	Preview – week 8/9 Review – week 14	Preview – week 15 Review – week 20 Cumulative assessment Week 21	Preview – week 22 Review – week 28	Preview – week 29 Review – week 34/35 Cumulative assessment Week 33	Preview – week 36 Review – week 40
What feedback is given?	Preview test is self-marked. Review test marked by teacher and score provided to the students. Further discussion of correct methods may be included as appropriate. Cumulative assessments are marked by teacher and returned to student. As appropriate to the group's needs, the teacher may spend time looking at correcting questions with the whole class or with small groups. In lessons, teachers may use live whole-class and individual feedback. This may be verbal or written as appropriate.					
What actions must take place for teachers?	Preview test informs teacher planning for the term's units – what existing knowledge do the students have? What gaps need to be filled by the teaching of each unit of work? Review test informs Do Now and home learning for the following term to fill gaps and reinforce topics through retrieval practice. Where a gap exists for a topic which feeds into a new unit of work, the teacher needs to be aware and fill that gap before the next topic which needs it. Cumulative assessments inform retrieval tasks and home learning for the next term. The final cumulative assessment, combined with teacher knowledge of the students, informs the allocation of student groups for the following academic year. A QLA of the final assessment is stored centrally to inform the following year's teacher of weaker areas in the group's collective knowledge.					
What actions must take place for students ?	Students engage with the learning in the lesson. They must complete home learning tasks to support gap filling. Where directed, students must engage in correcting their cumulative assessments					
When is this revisited?	Percentages Probability Ratio	Proportion Data Graphs	Solving equations transformations			Ratio

NOTE: The below only applies to Year 9 until July 2022; a new assessment map will be implemented from September 2022 when the new curriculum rolls through.

Year 9	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
What powerful knowledge is being assessed?	Year 7 & 8 knowledge plus averages and indices & roots	PAV Expressions & Formulae (factorise quadratics for Higher) Transformations FDP (include recurring decimals for Higher)	Statistical Graphs Equations & Inequalities (Higher - quadratic equations by factorising) Ratio & Proportion	All topics to date (Yr 7 and 8 and 9) in TA2. SoW covers: Angles 1 (include bearings and angles in polygons) H/F - Pythagoras Higher - Trigonometry Linear and Quadratic Graphs	Probability FDPRP problem solving Sequences	All topics to date in TA3. SoW covers: Construction & Loci Angles Simultaneous Equations (for Higher only at this stage)
How (type of assessment)?	GCSE Foundation questions (two different papers)	No formal assessment, in class monitoring and home learning only.		GCSE Foundation questions (two different papers)	As Term 2/3	GCSE Foundation questions (two different papers)
When?	Week 6			Week 21		Week 33
What feedback is given?	Marks on each paper, % score on tracking, plus annotations as appropriate.	Verbal feedback in class, supported by written feedback as appropriate.		Marks on each paper, % score on tracking, plus annotations as appropriate.	As Term 2/3	Marks on each paper, % score on tracking, plus annotations as appropriate.
What actions must take place for teachers?	Note topics of knowledge gaps for home learning and Do Now. Whole class feedback on			Note topics of knowledge gaps for home learning and Do Now. Whole class feedback on key questions.		Note topics of knowledge gaps for home learning and Do Now. Whole class feedback on key questions.

	key questions.					
What actions must take place for students ?	Complete tasks set by teacher.			Complete tasks set by teacher.		Complete tasks set by teacher.
When is this revisited?	Throughout Year 9, 10 and 11					

Maths KS4 assessment map (Year 10)

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
What powerful knowledge is being assessed?	Expressions Pythagoras & Trig Indices & Standard Form Averages	Statistical Graphs Equations & Inequalities 1 Transformations Ratio & Proportion FDP Problems	Angles Statistical Graphs Linear Graphs Surds, Indices, Roots	Constructions & Loci (Simultaneous) Equations	Number Revision Bounds Probability Perimeter, Area, Volume	Similar shapes Non-linear Graphs Trigonometry or Angles
How (type of assessment)?	Low stakes: Weekly Skills Checks from MathsBox Higher – HA sets; Top Foundation – FA sets; Foundation – FB sets Cumulative assessments are cut-down GCSE papers to provide an actual grade.					
When?		Week 13 – TA1 (2 papers)		Week 25 – TA2 (3 or 4 papers)		Week 33 – TA3 (full papers?)
What feedback is given?	Weekly Skills Checks – self-mark and record progress on record sheets in books. TA1/TA2/TA3 – score and grades and formative feedback as appropriate. In lessons, teachers may use live whole-class and individual feedback. This may be verbal or written as appropriate.					
What actions must take place for teachers?	Use all assessments to identify gaps and identify misconceptions. Use Do Now activities, home learning and revision lessons to address the above. TA3 – teacher completes a formal QLA which informs revision programme for the start of Year 11.					
What actions must take place for students ?	Students engage with the learning in the lesson. They must complete home learning tasks to support gap filling. Where directed, students must engage in correcting their cumulative assessments. Students have student-friendly QLA sheets after TA3 to inform their independent study.					
When is this revisited?	Foundation – all topics are revisited as needed in Year 11 Higher – for set 2, many topics will be reviewed in Year 11; for set 1 topics are built on to cover the rest of the curriculum in Year 11.					

Maths KS4 assessment map (Year 11)

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
What powerful knowledge is being assessed? (FOUNDATION)	Vectors Revision based on Year 10 QLA	Sequences Compound Measures Algebraic Graphs Indices & Standard Form Equations & Inequalities	Revision based on Mock 1 QLA	Revision based on Mock 2 QLA	Revision based on Mock 2 QLA	N/A
What powerful knowledge is being assessed? (HIGHER SET 2)	Vectors Revision based on Year 10 QLA	Functions Graphs Iteration Quadratic Sequences Simultaneous Equations	Revision based on Mock 1 QLA	Revision based on Mock 2 QLA	Revision based on Mock 2 QLA	N/A
What powerful knowledge is being assessed? (HIGHER SET 1)	Vectors Revision based on Year 10 QLA	Functions Graphs (including trig) Iteration Quadratic Sequences Simultaneous Equations	Graphs of circles Gradient and area (non-linear graphs) Quadratic equations & inequalities	Revision based on Mock 2 QLA	Revision based on Mock 2 QLA	N/A
How (type of assessment)?	Low stakes: Weekly Skills Checks from MathsBox Top Higher – HAA sets; Higher – HA sets; Foundation – FA sets; Nurture – FB sets Low stakes: MethodMaths papers weekly with scaffolding Cumulative assessments are full GCSE papers to provide an actual grade.					
When?	Mock 1		Mock 2			
What feedback is given?	Weekly Skills Checks – self-mark and record progress on record sheets in books. Mock 1 & Mock 2 – score and grades and formative feedback as appropriate. In lessons, teachers may use live whole-class and individual feedback. This may be verbal or written as appropriate.					
What actions must take place for teachers?	Use all assessments to identify gaps and identify misconceptions. Use Do Now activities, home learning and revision lessons to address the above. Mock 1 & Mock 2 – teacher completes a formal QLA which informs revision programme for the rest of Year 11.					
What actions must take place for students ?	Students engage with the learning in the lesson. They must complete home learning tasks to support gap filling. Where directed, students must engage in correcting their cumulative assessments. Students have student-friendly QLA sheets after TA3 to inform their independent study.					
When is this revisited?	All topics are revisited using skills checks, MethodMaths and home learning.					

MATHS Year 12

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
What powerful knowledge is being assessed?	Algebra, functions, coordinate geometry	Further algebra, vectors, differentiation, data presentation, kinematics	Trigonometry, forces & Newton's laws, probability	Probability, sampling, distributions, hypothesis testing, integration, exponentials and logs	Variable acceleration; revise all skills to date	Revise all skills to date, begin Year 13 skills of trigonometry and differentiation
How (type of assessment)?	Termly homework packs for each teacher.		In-class assessment using AS Level questions.	Termly homework packs for each teacher.		Full AS paper as end of year assessment
When?	Submitted by the end of each term.		Week 19	Submitted by the end of each term.		June/July (depending on work experience week)
What feedback is given?	Annotations on work, scores for each pack.		Annotations on paper plus a score for the exam.	Annotations on work, scores for each pack.		Annotations on paper plus a score and AS Level grade for the exam.
	Live feedback occurs in each lesson as the teacher monitors students' work. This feedback may be verbal or written as appropriate.					
What actions must take place for teachers?	Whole class feedback; revise key skills in Do Now tasks.					Whole class feedback; revise key skills in Do Now tasks. Individual feedback on gaps which must be filled before Year 13 begins.
What actions must take place for students ?	Begin individual revision informed by knowledge gaps.					Continue individual revision informed by knowledge gaps.
When is this revisited?	Through Do Now and independent study.					Through Do Now and independent study.

Note: Further Maths is taught mainly online and includes online assessments for each unit of work. This changes year on year depending on the class size.

MATHS Year 13

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
What powerful knowledge is being assessed?	Year 12 content	Year 12 content	Year 12 content plus Year 13 topics: Trigonometry Differentiation Functions Parametrics Further Algebra Sequences & Series Normal distribution Moments Forces	All content from both years except for Numerical Methods and Further Kinematics		
How (type of assessment)?	Low stakes – AS papers to be completed at home on a fortnightly basis.		Cut down A Level Paper to be completed in class.	Full A Level paper		
	Live feedback occurs in each lesson as the teacher monitors students' work. This feedback may be verbal or written as appropriate.					
When?	Every 2 week, alternating between Pure and Applied papers.		By Feb half term	Last week before Easter		
What feedback is given?	Papers are checked by staff for final numerical answers. Some comments may be added to papers as appropriate.		Marked by staff according to exam criteria. Comments added to solutions as needed.			
What actions must take place for teachers?	If a question is identified as a problem for the class, talk through this at the first opportunity in class. If this is a knowledge gap which may impact on Year 13 content, address it through retrieval starters or home learning.		Gap filling lessons/retrieval starters to reflect the issues identified by the papers.			
What actions must take place for students ?	Use feedback and model solutions/markschemes to improve their work. Use independent learning time to fill knowledge gaps.		Corrections of their papers; independent revision of identified gaps.			
When is this revisited?	The next time this type of paper is issued, similar topics will be assessed.		Through starters.	Revision lessons in Term 5		

Note: Further Maths students are assessed formally at the same points as Maths students with cut-down papers. The topics covered vary each year depending on the lesson allocation.

Year 7

Year	Term	Unit	Knowledge (students learn)	Skills (students learn how to)
	1	Place Value		Ordering numbers Using < and > to compare numbers Rounding numbers
		Units of Measure	Conversions between metric measures	Accurate use of a ruler Reading scales
		Time	Units of time	Telling the time from analogue clocks Solving problems involving time
		Operations: adding & subtracting	Perimeter	Add and subtract integers and decimals (positive and negative) Check answers using estimation
	2	Angle Facts	- Angles - on a line - at a point - in a triangle in a quadrilateral	Definition and types of angles Accurate use of a protractor Solve problems involving angles - on a line - at a point - in a triangle in a quadrilateral
		Operations: Multiplying & dividing	Area formulae for: - rectangles - triangles - parallelograms	Multiply and divide integers and decimals (positive and negative) Check answers using estimation Find the area of: - rectangles - triangles - parallelograms - compound shapes
		Types of Number	Identify multiples, factors and primes Square (up to 15 x 15) and cube numbers (up to 5^3) and related roots	Index notation for larger powers (Not laws of indices)
	3	Coordinates		Coordinates in all 4 quadrants Properties of 2D shapes Midpoint of two points
		Data Graphs		Pictograms

				Bar charts (including dual bar charts) Stem & Leaf diagrams
		Equivalence		Equivalence of fractions, decimals and percentages Equivalent fractions and mixed numbers
	4	Fractions		All four operations with fractions (including mixed numbers) Fractions of an amount
		Expressions		Collecting like terms Creating expressions from context Expanding single bracket expressions (including expand and simplify)
	5	Percentages		Percentage of an amount (with and without a calculator) Percentage increase and decrease Express A as a percentage of B
		Substitution	BIDMAS	Substitute into expressions Use simple formulae
		Averages	Mean, Median, Mode, Range from a list of data	
	6	Sequences		Continue sequences forwards and backwards including - arithmetic - non-linear - special sequences: square, triangle, powers Sequences from diagrams
		Equations		Solve one-step and two-step equations using inverse operations

Year 8

Year	Term	Unit	Knowledge (students learn)	Skills (students learn how to)
8	1	Fractions		Ordering fractions using equivalent forms Fractions of amounts in context Fractions in the context of area and perimeter
		Area and Perimeter	Formulae for area of: - Rectangle - Triangle - Parallelogram - trapezium	Find the perimeter of polygons Find the area of shapes including rectangles, triangles, trapezia parallelograms
		Angle Reasoning	Recall angle facts for triangles, points and straight lines.	Solve angle problems involving vertically opposite angles and angles in parallel lines
	2	Types of Number	Factors and multiples	Express integers as the product of their prime factors Find the HCF and LCM of a pair of numbers
		Averages	Recall the median, mode, mean and range.	MMMR from frequency tables MMMR from data charts (bar charts and stem-and-leaf diagrams)
		Percentages		Use decimal multipliers to find the result of percentage increase or decrease Solve problems involving simple interest and compound interest.

		Probability	Probability scales	Calculate theoretical probability (fraction, decimal or percentage) Use two-way tables Use frequency trees
	3	Algebraic Graphs		Real life graphs Plotting linear graphs Properties of linear graphs
		Indices	Laws of indces	Laws of indices Negative indices Working with standard form (SIF)
		3D shapes	Properties of 3D shapes. Using formula for volume of a prism	Calculating volume of prisms
	4	Ratio		Writing ratio from context or diagram Simplifying ratios and finding equivalent ratios Sharing amounts in a ratio
		Expressions		Factorise single bracket expressions Expand and simplify single bracket expressions Expand and simplify expressions with double brackets
		Data Graphs		Draw and interpret pie charts and scatter diagrams
	5	Solving Equations		Solve equations involving brackets and/or fractions Solve equations with the

				unknown on both sides Construct and solve equations in context
		Sequences		Find the nth term for arithmetic sequences Work with Fibonacci style sequences
		3D Shapes Part 2	Use relevant formula.	Sketch nets of 3D shapes Calculate the surface area of prisms
	6	Scale Drawing		Accurately use ruler, compasses and protractor Map reading Bearings Estimate unfamiliar heights/distances using familiar objects
		Proportion		Unitary method for proportion Adjust recipes Solve best buy problems Convert between metric and imperial units of measure Solve speed, distance and time problems
		Transformations		Carry out and describe individual transformations in 2D: Reflections (including algebraic mirror lines) Rotations about a given centre Translations Enlargements by positive scale factors

Year 9

Year 9	Term	Unit	Knowledge (students learn)	Skills (students learn how to)
	1	Percentages		• Use decimal multipliers to find the result of percentage increase or decrease • Solve problems involving simple interest and/or compound interest. • Calculate percentage profit or loss. • Reverse percentage problems
		Expressions		• Factorise single bracket expressions • Expand and simplify single bracket expressions • Expand and simplify expressions with double brackets • Factorise quadratic expressions
		Solving equations		• Solve equations involving brackets and/or fractions • Solve equations with the unknown on both sides • Solve quadratic equations by factorising • Construct and solve equations in context
		2D/3D shape properties	• Properties of 2D shapes including names/ lines of symmetry. • Properties of 3D shapes • Plans and Elevations	• Use properties of 2D shapes to solve problems with angles. • Identify faces, vertices and edges of 2D and 3D shapes. • Construct plans and elevations for a 3D shape.
	2	Angle reasoning	Angles in polygons - interior and exterior	Solve further angle problems involving • vertically opposite angles • angles in parallel lines •
		Bearings	Understand what a bearing is.	• Be able to draw and measure bearings. • Solve problems with bearings at 2 or more points. • Solving problems of scale within bearings.
		Inequalities		• Recognise inequality symbols. • Write an inequality represented by a number line. • State integer solutions for an inequality. • Solve inequalities with the unknown on one or both sides.
		Perimeter Area Volume (PAV)	Formulae for area of: - Rectangle - Triangle	Find the perimeter of polygons Find the area of shapes including

			- Parallelogram - Trapezium - Circle Circumference of circle Volume of prism	• rectangles, triangles, parallelograms • trapezia • circles • compound shapes from the above Calculating volume of prisms Calculate the surface area of prisms. • (More able students) Find surface area of Cylinders Find the Surface area of a 3D shape (prism) (incl compound)
	3	Ratio and Proportion		• Writing ratio from context or diagram • Simplifying ratios and finding equivalent ratios • Sharing amounts in a ratio • Unitary method for proportion • Adjust recipes • Solve best buy problems • Convert between metric and imperial units of measure • Solve speed, distance and time problems
		Algebraic graphs		• Real life graphs • Plotting linear graphs • Properties of linear graphs including finding the gradients • (More able students) Write the equation of a line using 2 points • Write the equation of a line parallel to a given line
		Probability		• Probability scales • Calculate theoretical probability (fraction, decimal or percentage) • Use two-way tables • Use frequency trees • Use and complete tree diagrams • Use and complete Venn Diagrams • (More able students) Using/drawing tree diagram to find probabilities of successive independent events
	4	Construction and Loci		• Construct triangles and quadrilaterals using protractors / compasses • Construct perpendicular bisectors and angle bisectors
		Averages	Mean, median, mode range	• MMMR from sets of data • MMMR from frequency tables • MMMR from data charts (bar charts and stem-and-leaf diagrams)
		Data graphs		• Draw and interpret pie charts • Draw and interpret scatter diagrams • Draw a frequency polygon

				• (More able students) Understand the difference between correlation and causation • Draw frequency polygons • (More able students) Draw and interpret Box plots • Draw and interpret frequency diagrams.
	5	Indices and Roots	Laws of indices	• Laws of indices • Negative indices • Working with standard form
		Transformations	• Reflection • Translation • Rotation • Enlargement	• Carry out and describe individual transformations in 2D: Reflections (including algebraic mirror lines) Rotations about a given centre Translations Enlargements by positive scale factors • (More able students) Enlargement by negative scale factors
		Sequences		• Find and use the nth term for arithmetic sequences • Use the nth term for quadratic sequences • Work with Fibonacci style sequences • (More able students)Find the nth term of a quadratic sequence
	6	Types of Number	Meaning of prime, factor, multiple	• List prime numbers • Find factors and multiples • Find HCF and LCM • Prime factor decomposition
		Rearranging formulae		• Rearrange linear formulae • Rearrange formulae with brackets, fractions, square roots • Rearrange with unknowns on both sides. • (More able students) Rearrange a formula including brackets, fractions and square roots • Make x the subject with more than 2 unknowns
		Pythagoras / Right angled trigonometry	Pythagoras theorem [Trigonometry formulae for right angled triangles]	• Use Pythagoras' Theorem to find a missing side in a right angled triangle • Use trigonometry to find a missing side of a right-angled triangle • Use trigonometry to find a missing angle of a right-angled triangle

Year 10

Year	Term	Unit	Knowledge (students learn)	Skills (students learn how to)
			Bold indicates topics which feature only on Higher tier.	
10	1	Expressions		Transform algebraic expressions by: - Simplifying - Expanding - Factorising - **Simplifying algebraic fractions**
		Pythagoras and Trigonometry	Pythagoras Theorem **Trigonometry ratios for right-angled triangles**	Find missing lengths using Pythagoras. **Find missing lengths and angles using trigonometry.**
		Indices & Standard Form	Laws of indices for multiplication, division and powers of powers. **Meaning of negative and fractional powers.** Standard Form.	Simplify a range of expressions using index laws. **Evaluate using a range of powers.** **Solve equations using laws of indices.** Write numbers in standard form; calculate in standard form.
		Fractions & Percentages		Solve a range of problems using fractions and percentages of amounts.
	2	Averages	Mean, median, mode, range	Calculate or estimate averages for lists of data or grouped data.
		Equations & Inequalities		Solve a range of linear **and quadratic** equations. Solve linear inequalities and represent solutions on number lines.
		Transformations		Reflect, rotate, translate and enlarge by positive **and negative** scale factors, including with a centre of enlargement.
		Ratio & Proportion		Solve a range of problems involving ratio and proportion. **Write formulae for direct and inverse proportion problems.**
	3	Angles	Angle facts from Key Stage 3. **Circle Theorems**.	Solve a range of problems involving angles (including angles in regular polygons). **Solve problems involving circle theorems; prove the circle theorems.**
		Statistical Graphs		Draw and interpret a range of statistical graphs, **including cumulative frequency, box plots and histograms.**
		Linear Graphs	**Parallel and perpendicular gradients.**	Plot and interpret graphs of linear functions. **Use the properties of linear graphs to find equations of parallel of perpendicular lines.**

	4	Indices, Roots and Surds	Laws of indices. **Laws of surds.**	Apply all previous skills. **Simplify surd expressions including rationalising the denominator.**
		Constructions and Loci		Use protractor, ruler and compasses to accurately construct shapes and loci.
		Rearranging formulae	Inverse operations.	Use appropriate techniques to change the subject of a formula.
		Simultaneous Equations		Use inverse operations to solve linear equations. **Solve linear simultaneous equations; begin to solve simultaneous equations where one is quadratic.**
	5	Number		Revise skills from previous work. **Capture-recapture problem-solving.** **Solve problems involving upper and lower bounds.**
		Probability	Probability scales. Set notation. **AND rule for probability.**	Solve a range of probability problems including use of probability trees, Venn diagrams, two-way tables and frequency trees.
		Perimeter, Area, Volume	Formulae for areas and perimeters of: - Rectangle - Triangle - Trapezium - Parallelogram - Circle - **Sectors** Formulae for volumes of - Cuboid - Prism - **Pyramid** - **Sphere** **Scale factors for perimeter, area and volume of similar shapes.**	Solve problems involving perimeter, area and volume at an appropriate level. **Solve problems involving perimeter, area and volume of similar shapes.**
	6	Non-linear graphs		Plot graphs of quadratic, cubic, **reciprocal** functions. Recognise the key features of these.
		Geometry	**Trigonometry for non-right-angled triangles:** - **Sine rule** - **Cosine rule** - **Area of triangles**	Review geometry topics as required (identified from assessments). **Use the sine rule, cosine rule and area of triangle formulae to solve problems.**